Cardiac differentiation of embryonic stem cells with point-source electrical stimulation.

Journal: Conf Proc IEEE Eng Med Biol Soc

Publication Year: 2008

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PubMed link: 19163013

Funding Grants: Technology for hESC-Derived Cardiomyocyte Differentiation and Optimization of Graft-Host Integration in Adult Myocardium

Public Summary:

Scientific Abstract:
The use of pluripotent stem cells as a means to repair damaged heart tissue has recently emerged as a promising, yet controversial therapy. Despite the different approaches and the variety of cell types used, many of these procedures have been met with mixed success. The lack of understanding of the differentiation and integration process, notably with respect to electrical signaling, significantly hampers the development of these therapies. A system was thus developed allowing the use of point source electrical stimulation on embryonic stem (ES) cells to study the effect of physiologically-relevant electrical stimulus. When modulating the amplitude of the stimulus over various differentiation stages of embryonic stem cells, differences in the proportions of cardiomyocytes to embryonic stem cells were observed through quantitative PCR. The use of this technique might have larger applications in understanding molecular pathways towards the regeneration process.

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